



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/721,689	11/24/2003	Yoon-Jong Song	9898-339	6151

7590 11/03/2004
MARGER JOHNSON & McCOLLOM, P.C.
1030 S.W. Morrison Street
Portland, OR 97205

EXAMINER

QUACH, TUAN N

ART UNIT PAPER NUMBER

2814

DATE MAILED: 11/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

an

Office Action Summary	Application No. 10/721,689	Applicant(s) SONG ET AL.	
	Examiner Tuan Quach	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☒ Claim(s) 20 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 10/354,651.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>11/24/03</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim 20 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 7. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k). These claims cover identical subject matter.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-11 are rejected under 35 U.S.C. 102(e) as being anticipated by Joo (US 2003/0141527).

The applied reference has a common inventor/assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

In reference to claim 1, Joo shows, see [0036] –[0052], Figs. 1-8, a ferroelectric memory device comprising a lower insulating layer 74 formed on semiconductor substrate 51, at least two adjacent ferroelectric capacitors 82 disposed on the lower insulating layer, an interlayer insulation layer 87 formed over the ferroelectric capacitors leaving the top surface of the capacitors exposed, a patterned via etchstop layer 89 formed on the interlayer insulation layer, an upper interlayer insulating layer 91/95, plate line 99 commonly connected to the at least two adjacent ferroelectric capacitors 82. In reference to claim 2, plate line 99 contacts the patterned via etchstop layer 89 disposed between the at least two adjacent ferroelectric capacitors, e.g., Fig. 2. Regarding claim 3, the etchstop layer being made of a material having different etch selectivity from the interlayer insulation layer and the upper interlayer insulating layer correspond to functional characteristics not resulting in any delineated structural characteristics thus would have been met and inherent over the teachings as delineated, and as the different material is taught and encompassed. Regarding claim 4, the interlayer insulation being oxide and via etchstop layer 89 being materials such as titanium oxide, aluminum oxide, etc., is taught as delineated, e.g., [0042], [0084], and wherein the interchangeability of suitable materials would have been apparent. Regarding claims 5 and 11, the slit shaped common via hole and the overlapping cell via holes is shown, e.g., [0041]. Regarding claims 6 and 7, the further inclusion of encapsulating barrier is shown, [0042] including the double layer structure 89 and the conventional metal oxide materials delineated. Regarding claim 8, the strapping lines 93 disposed between first upper interlayer insulating layer 91 and second insulating layer 95 placed adjacent the

Art Unit: 2814

plate line is shown, e.g. [0044]. Regarding claim 9, the lower insulating layer comprising plurality of cell transistors 57, bit lines 71, contact plugs 75, ferroelectric capacitors electrically contacting source regions 61s through the contact plugs are taught, e.g., [0036], Fig. 2. Regarding claim 10, the ferroelectric capacitors including lower electrode 77, ferroelectric layer pattern 79, upper electrode layer 81, and plate line in direct contact with the upper electrode is shown, Fig. 2, [0037].

Claims 12-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Joo (US 2003/0141527).

The applied reference has a common inventor/assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

In reference to claim 12, Joo shows, see [0036] –[0052], Figs. 1-8, a ferroelectric memory device comprising a lower insulating layer 74 formed on semiconductor substrate 51, at least two adjacent ferroelectric capacitors 82 disposed on the lower insulating layer, an interlayer insulation layer 83a disposed between the ferroelectric capacitors extending to substantially the same height as the ferroelectric capacitors leaving the top surface of the capacitors exposed, a patterned via etchstop layer 87/89 formed on the interlayer insulation layer, an upper interlayer insulating layer 91/95, plate

Art Unit: 2814

line 99 commonly connected to the at least two adjacent ferroelectric capacitors 82.

Regarding claim 13, the etchstop layer being made of a material having different etch selectivity from the interlayer insulation layer and the upper interlayer insulating layer correspond to functional characteristics not resulting in any delineated structural characteristics thus would have been met and inherent over the teachings as delineated, and as the different material is taught and encompassed. Regarding claim 14, the interlayer insulating and upper insulating layer being oxide and via etchstop layer 89 being materials such as titanium oxide, aluminum oxide, etc., is taught as delineated, e.g., [0042], [0084] and wherein the interchangeability of suitable materials would have been apparent. Regarding claim 18, the slit shaped common via hole and the overlapping cell via holes is shown, e.g., [0041]. Regarding claims 15, 16, 20, the further inclusion of encapsulating barrier is shown, [0042] including the encapsulating barrier 89 itself or the upper layer of the double layer structure 89 and the conventional metal oxide materials delineated. Regarding claim 17, the ferroelectric capacitors including lower electrode 77, ferroelectric layer pattern 79, upper electrode layer 81, and plate line in direct contact with the upper electrode is shown, Fig. 2, [0037]. Regarding claim 19, the interlayer insulating being planarized is apparent as shown, e.g., Fig. 2.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 4 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Joo taken with Mandal (6,541,367).

Regarding these claims, in addition to the anticipation teachings delineated supra, the selection of suitable alternative materials delineated in these claims not recited in Joo, e.g., silicon nitride, silicon oxynitride in claim 4, and 14, is well within the purview of one skilled in the art and as such would have been obvious to one skilled in the art and wherein the interchangeability of suitable alternative conventional materials does not require any inventiveness and would have been obvious as evidenced by Mandal, column 16, lines 29-30.

Claims 16 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Joo taken with Harris (6,730,601).

Regarding these claims, in addition to the anticipation teachings delineated above, the selection of suitable alternative materials delineated in these claims not recited in Joo, e.g., silicon nitride, in claim 16, 20, is well within the purview of one

Art Unit: 2814

skilled in the art and as such would have been obvious to one skilled in the art and wherein the interchangeability of suitable alternative conventional materials does not require any inventiveness and would have been obvious as evidenced by Harris, the abstract, column 7 lines 16-20.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Summerfelt et al., Ma et al., Miller et al., both Lee et al., are made of record.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Quach whose telephone number (571) 272-1717. The examiner can normally be reached on M - F from 8 to 4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-1562.

TJ Quach

Tuan Quach
Primary Examiner